action of phosphorus pentachloride and of bromine on this latter substance. The cymene obtained from absinthol and citronellol yields terephthalic and acetic acids on oxidation.—On the perbromates. Preliminary notice, by M. M. Pattison Muir. The author has undertaken the preparation of a number of these salts.—On two coals from Cape Breton, their cokes and ashes, with some comparative analyses, by Henry How. The remainder of the journal is devoted to abstracts from British and foreign journals.

THE *Geographical Magazine*, June.—This number opens with a valuable article by Mr. C. R. Markham, on the Railways of Peru.—The longest and most important paper, from a scientific point of view, is by Mr. H. P. Malet on Bone Caves, in which the author's conclusions differ in several points from those generally accepted.—Other articles are on Singapore, and on the British colonial wool trade, by Mr. W. Robinson.—In connection with the American Geographical Society, letters are given from Capt. Buddington, and three other officers of the *Polaris* expedition, in which all but Buddington agree in stating that had Hall lived the ship would have pushed much further north, and that there would be no difficulty in some future properly equipped expedition doing so.

THE *Geological Magazine*, June.—The original papers in this number are the following :—Description of *Cycloptychius*, a coal measure fish, by Dr. R. H. Traquair, with a plate; Physical changes preceding deposition of cretaceous strata, by C. E. de Rance, F.G.S. ; On *Columnopora*, a new tabulated coral, by Prof. H. A. Nicholson, F.R.S.E., with a woodcut ; Glaciation of West Somerset, by W. C. Lucy, F.G.S. ; On the South of England ice-sheet, by James Croll, of the Geological Survey of Scotland; On *Polypora tuberculata* in Scotland, by Prof. J. Young, M.D., and Mr. John Young, Hunterian Museum, Glasgow; Landslips and Sinkings in Cheshire, by J. M.

Journal of the Society of Telegraphic Engineers, No 5.—The principal original papers in this part are the following :—On a method of testing short lengths of highly insulated wire in submarine cables, by Prof. Fleeming Jenkin, F.R.S. ; On the mechanical testing of telegraph wires, by R. S. Culley ; On the strength of cylindrical wrought-iron telegraph poles, by F. C. Webb ; On the percentage of averages, by W. H. Preeece ; On lightning protectors, by John Fletcher ; On equations connected with telegraph wire, by H. Mallock ; Tables to facilitate the calculation of strains of overhead line wires, by Robert Sabine.

Transactions of the Glasgow Society of Field Naturalists. Part II. Session 1873-74.—This Society was established in 1871, and seems to be in a prosperous condition so far as members are concerned, and, to judge from the brief reports of the meetings, is doing good work. The Society meets all the year over, specimens being exhibited and papers read at all the meetings ; the papers contain the results of observation as well as occasionally of speculation, and show that the members can observe and think to good purpose. In summer the Society makes excursions to various places in Scotland, an account of the results of these excursions being read at the meetings. The paper of greatest novelty in this publication is Contributions to a knowledge of the Scotch Cynipidæ, by Mr. P. Cameron.

Astronomische Nachrichten, Nos. 1,989, 1,990.—In these numbers is contained a long paper by J. G. Galle on a method of calculating the paths of bright meteors, and he gives the orbits of the meteors of July 11 and 19, 1873. The elements of Planet (127) are given by Henry Renan. The elements of Coggia's comet are given by A. C. Dunér as follows :—

$$\begin{aligned} T &= 1874\text{, July } 20{\cdot}1670 \text{ Berlin time} \\ \omega &= 150^\circ\ 3'\ 16'' \\ \Omega &= 123^\circ\ 1'\ 55'' \\ i &= 72^\circ\ 52'\ 53'' \\ \log.\ q &= 9{\cdot}86894 \end{aligned}$$

The ephemeris for this comet is added, going up to Aug. 11.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti : t. vii. Fasc. v.—In this number M. Celoria has a note On the extremes of temperature observed in Milan since the year 1763. It appears rom his table that the minimum temperatures of the several years occurred 63 times in January, 27 in December, 19 in February, once in March (1785), and once in November (1866). The maximum temperatures occurred 62 times in July, 33 in August, 13 in June, once in May (1786). It is further observed that the minimum temperature in Milan is, on an average, $-9^\circ{\cdot}57$ (oscillating between $-2^\circ{\cdot}8$ and $-17^\circ{\cdot}2$) ; while the maximum temperature is, on an average, $34^\circ{\cdot}38$ (oscillating between $31^\circ{\cdot}5$ and $37^\circ{\cdot}7$). The average mutability of temperature is thus $43^\circ{\cdot}9$. The author also furnishes some data as to days of frost at Milan in 1838-73. The average number of these is found to be about 58 ; there was a minimum of 17 in 1872, and in the two years 1848 and 1858 the number rose to 85.—Prof. Mantegazza contributes a paper On the expression of pain. He groups all modes of painful expression in three categories ; viz. expressions of reaction, expressions of paralysis, and mixed expressions of pain and of different sentiments.—Prof. Garvaglio has a paper in vegetal pathology, treating of a parasitic fungus which produces a form of blight in rice.—Prof. Sayno describes some applications of the spiral of Archimedes to graphic calculation.—In the section of moral and political science, Prof. Cossa contributes a paper On political economy of people and states.

Annali di Chimica applicata alla Medicina. Nos. 3 and 4, March and April, 1874.—Under the heading of "Pharmacy" we notice in these numbers a paper by Carlo Pavesi on the compound of chloral hydrate with glycerine.—One by Giovanni Ruspini on the metallurgy and applications of bismuth.—F. Mayer contributes a note on the assay of alkaloids, and Leger one on metatartrate of magnesia.—Bultot writes on an alteration of bichloride of mercury.—Prof. G. Bizio contributes a paper on protosulphide of phosphorus.—In hygiene there is a paper on the disinfection of drains, by Prof. S. Zinno.—In toxicology C. Méniere d'Angers contributes a paper on the toxical properties of *salmoja*, the residue obtained in salting meat and fish for exportation ; N. Zuntz on the nature of the compound of carbonic oxide with hæmoglobulin ; Huseman on antidotes for phenic acid.—From the *Journal de Pharmacologie* two papers are translated, one on a case of arsenical poisoning, and one on the frequency of phenol poisoning in England.—In physiology there is a paper by Engel on metals and the human body ; and a paper by G. Gallo on a new fact favouring heterogenesis. We notice also an account of experiments on the production of bacteria in organic infusions, by E. R. Lankester, and a paper on the physiological and therapeutic effects of the active principle of ipecacuanha, by A. E. d'Orenellas.—In therapeutics S. Cadet has a paper on the efficacy of black sulphide of mercury in cholera ; Dr. Gimbert on the application of *Eucalyptus globulus ;* Prof. Binz on the action of bromide of potassium on the animal organism ; L. Tassinari on the transfusion of blood ; Prof. de Renzi on the use of sulphites in intermittent fever ; and on the injection of water and saline solutions into the veins in cholera, by Dr. Dujardin-Beaumetz.

Gazetta Chimica Italiana. Fasciolo iii. contains but two original communications, the first of which is by E. Paterno, On the identity of cymene from camphor and from essence of terebenthene. The cymene was prepared from camphor by a modification of Pott's process, enabling more than a kilog. of this substance to be acted on at once. 100 grm. of red phosphorus, 265 grm. of sulphur, and 780 grm. of camphor are well mixed in a suitable vessel, and then heated over a gas burner till cymene ceases to pass over. Analyses and descriptions of the calcium, barium, lead, potassium, sodium salts of cymene-sulphonic acid, from camphor cymene, as well as of the acid itself, are given.—Cymene from essence of terebenthene was prepared by Riban's method, and the same salts of the sulpho-acid studied.—The other paper is by Ugo Schiff on chromic peroxide and acid, being observations and experiments relating to a paper by E. Hintz (under the direction of Prof. L. Meyer) on these substances. The remainder of this part is occupied by abstracts from other journals.

Cosmos, May.—The principal papers in this number of the Italian geographical journal are an account of N. M. Prjewalsky's exploration of eastern Mongolia, the present contribution relating to his travels in the southern confines of Mongolia from Dala-Noor to Ala-Shan ; On the gold-bearing regions between the Limpopo and Zambesi, with a map ; and a continuation of the paper on recent expeditions into New Guinea.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, May 27.—John Evans, F.R.S., president, in the chair.—The following communications were read :—On the last stage of the Glacial period in North Britain, by T. F. Jamieson. In this paper the author arranged the Glacial phenomena of Scotland under the three following heads :—(1) The great early glaciation by land-ice (maximum effects of glaciation). (2) The period of Glacial marine beds containing remains of arctic mollusca, when most of the country was covered by the sea. (3) The time of the late glaciers, the special subject of the paper. After expressing himself in opposition to the hypothesis of a great polar ice-cap, the author described this last period as one not of mere local glaciers, but as characterised by a return of a great ice-sheet over nearly the whole of Scotland and Ireland; but he stated that this ice-sheet was probably neither so thick, so extensive, nor so enduring as that of the first period of glaciation, which cleared away everything in the shape of superficial deposits, down to the hard rock. He believed, however, that in the last period the mountains of Scotland and Wales, as well as the Penine range and the rest of the north of England as far as Derby, were covered with thick ice, which in most parts reached down to the sea, and that extensive snow-beds prevailed over the rest of England. In the summer months the melting of these would give rise to streams of muddy water, and produce the superficial deposits of brick-earth, warp, and loess; whilst when the currents were stronger, perhaps from the thaw being unusually rapid, deposits of gravel would be formed. This second ice-sheet would gradually become less and break up into valley-glaciers, which in their retreat would leave kaims and eskers at low levels, and moraines in the mountain-glens. During this time no new great submergence of the country took place; and the last great modifications of the surface were sub-aërial, and not submarine, the work having been done by frost, rain, and glaciers.—Notes on the Upper Engadine and the Italian valleys of Monte Rosa, and their relation to the glacier-erosion theory of lake-basins, by the Rev. T. G. Bonney. The author stated that he had examined (1) the small lakes on the summit of the Bernina Pass. These were situated in a position very favourable to glacier-erosion, and he thought might be attributed to that cause. (2) The lakes on the upper part of the Maloya Pass. These lay in three rock-basins, and at first sight seemed favourable to the glacier-erosion theory; but further examination showed that they were in no way connected with the Glacial system of the neighbourhood, and were probably Preglacial. (3) The Val Bregaglia to the Lake of Como. The presence of barriers in the valley, its frequent V-like form, and the signs of Glacial action to near the present level of the stream, seemed to indicate that the glacier had had but slight erosive power. (4) The Como arm of the lake. It was shown that the glacier, which was supposed to have excavated the lake, had passed over the ridge of Nagelfluhe and Molasse that encloses it, and had not been able to grind away its remarkably sharp crest. (5) Similar evidence was produced with regard to the Lake of Orta. (6) The Italian valleys east of Monte Rosa. These were shown to offer difficulties precisely similar to those of the Val Bregaglia. The author therefore argued that these cases showed how superficial the action of the glaciers had been; and that they must have been wholly inadequate to excavate the greater lake-basins, since no approach to this form, no U-like trough, was found in the valleys down which the glaciers had flowed on their way to the lakes. As then the principal features of the district appeared to be Preglacial, he contended that disturbances of beds of the valleys along lines transverse to their direction were more likely to have produced the lakes.

Zoological Society, June 2.—Arthur Grote in the chair.—A letter was read from Mr. T. D. Forsyth containing an account of some of the animals met with in the vicinity of Kashgar.—An extract was read from a letter received from Mr. E. P. Ramsay, relating to a living cassowary (*Casuarius australis*), which he was proposing to send to the Society's collection.—Prof. Owen, F.R.S., read the fifth part of his series of memoirs on the "Osteology of the Marsupialia." This portion contained a general account of the osseous structure of the kangaroos.—Lieut.-Col. H. Irby exhibited specimens of apparently a new species of raven, which he had lately obtained in the vicinity of Tangier, Morocco, and which he was intending to describe under the name of *Corvus tingitanus*.—A communication was read from the Rev. O. P. Cambridge, on some new species of the Arachnidean family of *Drassides*, from various localities.—A communication was read from Dr. E. Grube, containing descriptions of new Annulata collected by Mr. E. W. H. Holdsworth on the coasts of Ceylon.—A communication was read from Mr. W. Nation on the habits of *Spermophila simplex*, as observed in the vicinity of Lima.—A communication was read from A. G. Butler containing a list of the butterflies of Costa Rica, with descriptions of new species.

Chemical Society, June 4.—Prof. Odling, F.R.S., president, in the chair.—The following papers were read:—1. Dendritic spots in paper, by H. Adrian. These he finds to consist of sulphide of copper, formed from particles of gun metal, derived from the machinery employed in manufacturing the paper; they are far more usually found in common paper than in the better classes. 2. The acidity of normal urine, by J. Resch, M.A. 3. On a simple method of estimating urea in urine, by Dr. Russell and Mr. West. The apparatus employed for this purpose was exhibited, and a practical illustration given by Mr. West. 4. On ipomæic acid, by E. Neison and J. Bayne. This acid, prepared by the action of nitric acid on jalapin, the authors find to be identical with sebacic acid. 5. On certain compounds of albumin with the acids, by G. S. Johnson. 6. On sulphide of acetyl, and 7. On a new method of preparing toluene: both by Dr. D. Tommasi. 8. Note on New Zealand Kauri gum, by M. M. P. Muir.

Royal Horticultural Society, May 27.—Scientific Committee.—R. M'Lachlan, F.L.S., in the chair.—The Rev. M. J. Berkeley remarked with respect to the Thread Blight of the tea in Assam:—"I have carefully examined the thread blight in company with Mr. Broome. We could find not the slightest trace of fruit, and therefore we are unable to say to what genus its perfect state belongs. It seems to run indifferently over plants belonging to very different natural orders. The leaves of *Andrachne trifoliata*, a plant which it also attacks, are very much damaged by minute lichens belonging to the genus *Strigula*. In one perfect asci were discovered with minute sausage-shaped sporidia, in the other only stylospores were found, but of a very peculiar character. They were staff-shaped, hollowed out on either side, septate, and seated on very long pedicels." Mr. Berkeley also placed before the committee a curious fungus from New Jersey, which affects *Cupressus thujoides*. Mr. J. B. Ellis, who sent it him, remarks, "It grows from the same matrix yearly, generally at the extremities of the branches, which it causes to swell and branch in a brush-like or digitate manner." It appeared to agree with *Podisoma* except in possessing no gelatinous investment, and would appear to constitute a new genus.—Mr. M'Lachlan remarked, with reference to the *Termes* exhibited at the last meeting from the wood of Zanzibar copal (*Trachylobium*), that he had ascertained that it did not belong to the subgenus *Eutermes*, but to *Calotermes*. It seems to be an undescribed species, allied to *Calotermes solidus* Hagen, but differing slightly. The original locality for that species is unknown. Hagen, in his monograph of the family, speaks of having seen two specimens of *C. brevis*, a species from Central and South America, inclosed in copal. It would not be expected to find an American species under these conditions, and the individuals in question may possibly have been the same as those from Kew. In the south of France two small indigenous species (one belonging to *Calotermes*) do considerable damage, and a small North American species (*Eutermes flavipes*) had at one time established itself in the hot-houses of the gardens of Schönbrunn, at Vienna, principally infesting the tubs in which plants were growing.—Mr. Andrew Murray sent a note on the section of a stem of *Macrozamia spiralis*, exhibited at the last meeting, and which was completely riddled by the borings of a weevil, described by Mr. Pascoe under the name of *Tranes internatus*.—Prof. Thiselton Dyer read the following extract from a letter addressed by Mr. W. H. Tillett to Dr. Hooker:—"April 26.—*Philodendron selloum* is now in bloom again. Last night I fancied it was emitting heat, and in testing this with a thermometer found it was so. The heat in the house was 58° F., and the thermometer rose at once to 68° F. I have tested it again this evening, and the thermometer rises from 58° F. to 74° F. April 27.—Testing the *Philodendron* last night, I found it was 35° F. above the temperature of the house. The house was 56°, and the flower—one newly opened—91°."—Dr. Voelcker thought the committee would like to know the results of his investigation of the soil of a London square in which Messrs. Veitch had twice planted planes, which in each case had died. He found, on examining the clear watery solution from treating the soil with distilled water, that the soil contained one-tenth per cent. of common salt and two-tenths per cent. of nitrates. Now it was obvious that this was really a considerable quantity, when it was considered that one-tenth per cent. of common salt would amount to a ton mixed with 6 in. of soil over an acre. He might say parenthetically that whenever the amount of chlorine in soil reached anything like an appreciable quantity, it exercised an injurious influence.

General Meeting.—Henry Webb in the chair.—The Rev

M. J. Berkeley commented on the injury done to pears by a species of *Cecidomyia* and also by a fungus *Helminthosporium pyrorum* which produced the unsightly cracking of the surface.

Royal Microscopical Society, June 3.—Charles Brooke, F.R.S., president, in the chair.—Mr. Slack called attention to a slide exhibited under one of the Society's microscopes, as being a remarkable specimen of Herr Müller's technical skill in diatom mounting. The slide had photographed upon it, in an extremely beautiful and perfect manner, eighty spaces with the names of diatoms below each, and a diatom of corresponding species was mounted in every space.—Mr. Charles Stewart described and figured on the blackboard the peculiar position of the touch corpuscles in the skin of the hand; he also exhibited and described a section of an Ascidian, and explained the method of preparation.

BOSTON, U.S.

Society of Natural History, Jan. 7.—Dr. T. Sterry Hunt read a paper on the stratification of rock-masses. The crystalline rocks are commonly divided into stratified and unstratified. These two classes correspond to what the author has designated indigenous and exotic rocks, but a third class must be distinguished, which he has called endogenous rocks, and which appear to have been deposited from solutions, not in open basins, but in fissures at greater or less depths from the surface, and under peculiar conditions of temperature and pressure. To these crystalline deposits belong the various veinstones, including many of the so-called granites, especially those containing the rarer mineral species. The speaker desired to call attention to the fact that a stratiform or layer-like arrangement of the constituent parts is often met with, both in exotic and endogenous rocks, and cannot be regarded as characteristic of indigenous rocks, nor as a proof of aqueous deposition at the earth's surface. While admitting the frequent occurrence of the banded structure in eruptive rock, and the necessity in many cases of a careful geognostical study to determine to which class a stratiform rock should be referred, the speaker maintained the truly indigenous character of the great formations of gneissic rocks, such as, for example, the Laurentian, which from their wide extent, and from the mode of their association with layers of quartzite, limestone and iron-oxides, were clearly deposited in horizontal layers at the earth's surface.

Feb. 4.—Mr. J. A. Allen read a paper on geographical variation in colour among North American squirrels, exhibiting many specimens in illustration of his remarks. The law of geographical variation in size, that representatives of the same species decrease in size with decrease in latitude or altitude of their range, was established by Prof. Baird in 1857-58, in respect to both mammals and birds, who also noticed the occurrence of variation with locality in some other respects. Laws have been found to govern these variations as well, and are as follows:—(1) enlargement of peripheral parts towards the southward; (2) increase in depth, intensity, and extent of dark colours towards the southwards, and (3) increase of colour with increase of humidity, or the correlation of intensity of colour and the mean annual rainfall. Mr. Allen then proceeded to notice the application of these laws to the family of squirrels.—Prof. C. H. Hitchcock spoke of his studies of the Helderberg rocks of New Hampshire. He also described in detail the geology of the northern part of Grafton County, New Hampshire, where the Helderberg Rocks can be best studied.

PARIS

Academy of Sciences, June 1.—M. Bertrand in the chair.—M. Jamin presented the following paper in continuation of his researches on magnetism:—On the part played by the mean section, the polar surfaces, and the armatures of a magnet. The author concludes that the mean section determines the quantity, and the surface the distribution, of the magnetism.—Presentation of an ingot of 250 kilogrs. of platinum iridium alloy, cast at the Conservatoire des Arts et Métiers, May 13, 1874, by M. le Gen. Morin. This enormous ingot is more than 1 metre in length, and contains about 10·3 per cent. of iridium. It was fused in a furnace of limestone by means of an oxyhydrogen blow-pipe with seven jets, the fusion being completed in from 65 to 70 minutes.—M. Chevreul communicated a paper containing observations on M. Boussingault's paper on the transformation of iron into steel.—M. Boussingault made some remarks in reply, and MM. Dumas and Pasteur added some observations.—Observations on the dwarf African races, *à propos* of the photographs of Akkas sent by Prof. Panceri, by M. de Quatrefages.—Researches on the simultaneous diffusion of certain salts, by M. C. Marignac.—Probable decrease in the water supply from the Seine basin in the summer and autumn of 1874, by MM. E. Belgrand and G. Lemoine. The authors predict that the water supply will fall very low from now to the middle of October.—Memoir on the bay of St. Jean de Luz, by M. Bouquet de la Grye.—New process for engraving on copper, by the same author. The plate is first coated with a thin layer of silver, on which is spread a coloured varnish, and the design is then engraved with a dry point. The tracing is finally etched by a solution of ferric chloride.—Note on magnetism, by M. J. M. Gaugain. The present researches relate to the magnetisation of hardened steel.—On the motion of the air in pipes (fourth note), by M. Ch. Bontemps.—On the adulteration of bee's-wax with Japanese wax, by M. Ch. Mène. The author has determined the densities of the pure substances and of mixtures containing the two kinds of wax in varying proportions.—On the integrals of the differential equations of curves of which the locus of the centres of the intersecting ellipsoids, similar and similarly placed, is a given curve, by M. l'Abbé Aoust.—On a mechanical problem, by M. H. Durrande.—On the principles of correspondence of the plane and of space, by M. Zeuthen.—On the flatness of the planet Mars, by M. Amigues. The author arrives at the conclusion that the planet was formed in two or more stages and that the mean density of the superficial layers is 1·54 of the mean density of the nucleus.—On the shock of bodies (second note), by M. G. Darboux.—Perfection of electric chronographs, and researches on electro-magnets, by M. Marcel Deprez.—Study of the products formed by the action of hydrochloric acid on cast-iron and steel, by M. S. Cloëz. The author has separated and made analyses of several hydrocarbons.—On the new triangulation of the Isle of Corsica, by M. F. Perrier.—Of the spectrum of muscle, by M. L. Ranvier. The author has devised an instrument called a *myospectroscope*, of which the action depends on the fact that striated muscular fibre when properly prepared acts as a natural diffraction grating.—On certain particulars of the history of casein and albumen *à propos* of a recent note by M. Commaille, by M. A. Béchamp.—Experiments which explain the difference of opinion on the constitution of the iron in the blood, by MM. Paguelin and L. Jolly.—On the *Tyroglyphus* of the vine, by M. A. Fumouze. This Acarus (*T. echinopus*) is stated by Planchon to destroy Phylloxera, but the author of the present communication does not speak of it hopefully as an agent of destruction of the vine scourge.—On a new indigenous genus of terrestrial Lombricians (*Pontodrilus marionis*), by M. E. Perrier.—On the mode of contagion of cholera, by M. Ch. Pellarin.

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